Organisms

Life evolved after oceans formed, as the ocean environment provided the necessary nutrients and support medium for the initial simple organisms. It also protected them from the harsh atmospheric UV radiation. As organisms became more complex they eventually became capable of living on land. However, this could not occur until the atmosphere became oxidizing and a protective ozone layer formed which blocked the harmful UV radiation. Over roughly the last four billion years, organisms have diversified and adapted to all kinds of environments, from the icy regions near the poles to the warm tropics near the equator, and from deep in the rocky crust of the earth to the upper reaches of the troposphere.

Despite their diversity, all living organisms share certain characteristics: they all replicate and all use DNA to accomplish the replication process. Based on the structure of their cells, organisms can be classified into two types: eukaryotes and prokaryotes.

The main difference between them is that a eukaryote has a nucleus, which contains its DNA, while a prokaryote does not have a nucleus, but instead its DNA is free-floating in the cell. Bacteria are prokaryotes, and humans are eukaryotes. Organisms can also be classified according to how they acquire energy. Autotrophs are "self feeders" that use light or chemical energy to make food. Plants are autotrophs. Heterotrophs (i.e. other feeders) obtain energy by eating other organisms, or their remains. Bacteria and animals are heterotrophs. Groups of organisms that are physically and genetically related can be classified into species. There are millions of species on the earth, most of them unstudied and many of them unknown. Insects and microorganisms comprise the majority of species, while humans and other mammals comprise only a tiny fraction. In an ecological study, a single member of a species or organism is known as an individual.